CROCS
Controller to RSU Open C-ITS Schema

Schema

Draft Rev. 0.1

6 February 2017

Contents

Version History

Version	Date	Details
Draft 0.1	06/02/17	First published version

1   CROCS Schema

The CROCS schema is made up of a SOAP header definition (WSDL) and five XML Schema Definitions (XSD) as follows:

crocs.wsdl   - SOAP header definition file
CROCS-0-1.xsd - Main CROCS schema
ITS-Container.xsd - Data types used in ITS
REGION.xsd   - Regional variations
REG-D.xsd   - European specific variaitions
asn1.xsd   - ASN.1 specific data types

These schemas are stored and available at

www.idtuk.com/downloads/crocs/

This is a temporary location until CROCS is adopted by the relevant standards body.

1.1   crocs.wsdl – SOAP header definition file

```xml
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="crocs" targetNamespace="crocs"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:tns="crocs"
  xmlns:CROCS-0-1="CROCS-0-1"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/">

  <wsdl:types>
    <xsd:schema targetNamespace="CROCS-0-1">
      <xsd:import schemaLocation="http://www.idtuk.com/downloads/crocs/schema_0-1/CROCS-0-1.xsd"
        namespace="CROCS-0-1">
      </xsd:import>
    </xsd:schema>
  </wsdl:types>

  <wsdl:message name="mapInput">
    <wsdl:part name="MapData" element="CROCS-0-1:MapData" />
  </wsdl:message>
  <wsdl:message name="spatInput">
    <wsdl:part name="SPAT" element="CROCS-0-1:SPAT" />
  </wsdl:message>

  <wsdl:portType name="CrocsPortType">
    <wsdl:operation name="MapCommunicate">
      <wsdl:input message="tns:mapInput"></wsdl:input>
    </wsdl:operation>
    <wsdl:operation name="SPATCommunicate">
      <wsdl:input message="tns:spatInput"></wsdl:input>
    </wsdl:operation>
  </wsdl:portType>

  <wsdl:binding name="CrocsBinding" type="tns:CrocsPortType">
    <soap:binding style="document"
      transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="MapCommunicate">
      <soap:operation style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
    </wsdl:operation>
    <wsdl:operation name="SPATCommunicate">
      <soap:operation style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
    </wsdl:operation>
  </wsdl:binding>

  <wsdl:service name="CrocsService">
    <wsdl:port name="CrocsPort" binding="tns:CrocsBinding">
    </wsdl:port>
  </wsdl:service>
</wsdl:definitions>
```

1.2   CROCS-0-1.xsd - Main CROCS schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="CROCS-0-1"
  targetNamespace="CROCS-0-1"
  xmlns:ITS-Container="ITS-Container"
  xmlns:REGION="REGION"
  xmlns:REG-D="REG-D"
  xmlns:asn1="asn1">

  <xsd:import namespace="ITS-Container" schemaLocation="http://www.idtuk.com/downloads/crocs/schema_0-1/ITS-Container.xsd"/>
  <xsd:import namespace="REGION" schemaLocation="http://www.idtuk.com/downloads/crocs/schema_0-1/REGION.xsd"/>
  <xsd:import namespace="REG-D" schemaLocation="http://www.idtuk.com/downloads/crocs/schema_0-1/REG-D.xsd"/>
  <xsd:import namespace="asn1" schemaLocation="http://www.idtuk.com/downloads/crocs/schema_0-1/asn1.xsd"/>

  <xsd:element name="MapData" type="MapData"/>
  <xsd:complexType name="MapData">
    <xsd:sequence>
      <xsd:element name="msgID" type="DSRCmsgID2"/>
      <xsd:element name="msgSubID" minOccurs="0" type="DSRCmsgSubID"/>
      <xsd:element name="msgIssueRevision" type="MsgCount"/>
      <xsd:element name="layerType" minOccurs="0" type="LayerType"/>
      <xsd:element name="layerID" minOccurs="0" type="LayerID"/>
      <xsd:element name="intersections" minOccurs="0" type="IntersectionGeometryList"/>
      <xsd:element name="roadSegments" minOccurs="0" type="RoadSegmentList"/>
      <xsd:element name="dataParameters" minOccurs="0" type="DataParameters"/>
      <xsd:element name="restrictionList" minOccurs="0" type="RestrictionClassList"/>
      <xsd:element name="regional" minOccurs="0" type="RegionalMapData"/>
      <xsd:element name="crc" minOccurs="0" type="MsgCRC"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:element name="SPAT" type="SPAT"/>
  <xsd:complexType name="SPAT">
    <xsd:sequence>
      <xsd:element name="msgID" type="DSRCmsgID2"/>
      <xsd:element name="msgSubID" minOccurs="0" type="DSRCmsgSubID"/>
      <xsd:element name="intersections" type="IntersectionStateList"/>
      <xsd:element name="regional" minOccurs="0" type="RegionalSPAT"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="RegionalAdvisorySpeed">
    <xsd:complexContent>
      <xsd:extension base="REGION:Reg-AdvisorySpeed"/>
    </xsd:complexContent>
  </xsd:complexType>

  <xsd:complexType name="RegionalComputedLane">
    <xsd:complexContent>
      <xsd:extension base="REGION:Reg-ComputedLane"/>
    </xsd:complexContent>
```

```
</xsd:complexType>

<xsd:simpleType name="LaneID">
  <xsd:restriction base="xsd:unsignedByte"/>
</xsd:simpleType>

<xsd:simpleType name="Offset-B10">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-512"/>
    <xsd:maxInclusive value="511"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Node-XY-20b">
  <xsd:sequence>
    <xsd:element name="x" type="Offset-B10"/>
    <xsd:element name="y" type="Offset-B10"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="Offset-B11">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-1024"/>
    <xsd:maxInclusive value="1023"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Node-XY-22b">
  <xsd:sequence>
    <xsd:element name="x" type="Offset-B11"/>
    <xsd:element name="y" type="Offset-B11"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="Offset-B12">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-2048"/>
    <xsd:maxInclusive value="2047"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Node-XY-24b">
  <xsd:sequence>
    <xsd:element name="x" type="Offset-B12"/>
    <xsd:element name="y" type="Offset-B12"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="Offset-B13">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-4096"/>
    <xsd:maxInclusive value="4095"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Node-XY-26b">
  <xsd:sequence>
```

```
    <xsd:element name="x" type="Offset-B13"/>
    <xsd:element name="y" type="Offset-B13"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="Offset-B14">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-8192"/>
    <xsd:maxInclusive value="8191"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Node-XY-28b">
  <xsd:sequence>
    <xsd:element name="x" type="Offset-B14"/>
    <xsd:element name="y" type="Offset-B14"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="Offset-B16">
  <xsd:restriction base="xsd:short"/>
</xsd:simpleType>

<xsd:complexType name="Node-XY-32b">
  <xsd:sequence>
    <xsd:element name="x" type="Offset-B16"/>
    <xsd:element name="y" type="Offset-B16"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Node-LLmD-64b">
  <xsd:sequence>
    <xsd:element name="lon" type="ITS-Container:Longitude"/>
    <xsd:element name="lat" type="ITS-Container:Latitude"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RegionalNodeOffsetPoint">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-NodeOffsetPoint"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="NodeOffsetPoint">
  <xsd:choice>
    <xsd:element name="node-XY1" type="Node-XY-20b"/>
    <xsd:element name="node-XY2" type="Node-XY-22b"/>
    <xsd:element name="node-XY3" type="Node-XY-24b"/>
    <xsd:element name="node-XY4" type="Node-XY-26b"/>
    <xsd:element name="node-XY5" type="Node-XY-28b"/>
    <xsd:element name="node-XY6" type="Node-XY-32b"/>
    <xsd:element name="node-LatLon" type="Node-LLmD-64b"/>
    <xsd:element name="node-Regional" type="RegionalNodeOffsetPoint"/>
  </xsd:choice>
</xsd:complexType>

<xsd:complexType name="RegionalConnectionManeuverAssist">
```

```
<xsd:complexContent>
  <xsd:extension base="REG-D:Reg-ConnectionManeuverAssist"/>
</xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalGenericLane">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-GenericLane"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalIntersection">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-Intersection"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:simpleType name="PrioritizationResponseStatus">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="unknown"/>
    <xsd:enumeration value="requested"/>
    <xsd:enumeration value="processing"/>
    <xsd:enumeration value="watchOtherTraffic"/>
    <xsd:enumeration value="granted"/>
    <xsd:enumeration value="rejected"/>
    <xsd:enumeration value="maxPresence"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="SignalGroupID">
  <xsd:restriction base="xsd:unsignedByte"/>
</xsd:simpleType>

<xsd:complexType name="RegionalIntersectionState">
  <xsd:complexContent>
    <xsd:extension base="REG-D:Reg-IntersectionState"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalLaneAttributes">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-LaneAttributes"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalLaneDataAttribute">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-LaneDataAttribute"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalMapData">
  <xsd:complexContent>
    <xsd:extension base="REG-D:Reg-MapData"/>
  </xsd:complexContent>
</xsd:complexType>
```

```xml
<xsd:complexType name="RegionalMovementEvent">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-MovementEvent"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalMovementState">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-MovementState"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalNodeAttribute">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-NodeAttribute"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalPosition3D">
  <xsd:complexContent>
    <xsd:extension base="REG-D:Reg-Position3D"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalRestrictionUserType">
  <xsd:complexContent>
    <xsd:extension base="REG-D:Reg-RestrictionUserType"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalRoadSegment">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-RoadSegment"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalSignalControlZone">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-SignalControlZone"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RegionalSPAT">
  <xsd:complexContent>
    <xsd:extension base="REGION:Reg-SPAT"/>
  </xsd:complexContent>
</xsd:complexType>

<xsd:simpleType name="AdvisorySpeedType">
  <xsd:union memberTypes="xsd:token">
    <xsd:simpleType>
      <xsd:restriction base="xsd:token">
        <xsd:enumeration value="none"/>
        <xsd:enumeration value="greenwave"/>
        <xsd:enumeration value="ecoDrive"/>
        <xsd:enumeration value="transit"/>
      </xsd:restriction>
```

```xml
        </xsd:simpleType>
      </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="AllowedManeuvers">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="12"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="maneuverStraightAllowed"/>
                <xsd:enumeration value="maneuverLeftAllowed"/>
                <xsd:enumeration value="maneuverRightAllowed"/>
                <xsd:enumeration value="maneuverUTurnAllowed"/>
                <xsd:enumeration value="maneuverLeftTurnOnRedAllowed"/>
                <xsd:enumeration value="maneuverRightTurnOnRedAllowed"/>
                <xsd:enumeration value="maneuverLaneChangeAllowed"/>
                <xsd:enumeration value="maneuverNoStoppingAllowed"/>
                <xsd:enumeration value="yieldAllwaysRequired"/>
                <xsd:enumeration value="goWithHalt"/>
                <xsd:enumeration value="caution"/>
                <xsd:enumeration value="reserved1"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="12"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="Angle">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="28800"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="ApproachID">
  <xsd:restriction base="xsd:unsignedByte">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="15"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="DeltaAngle">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-150"/>
    <xsd:maxInclusive value="150"/>
```

```xml
    </xsd:restriction>
  </xsd:simpleType>

  <xsd:simpleType name="DescriptiveName">
    <xsd:restriction base="xsd:string">
      <xsd:minLength value="1"/>
      <xsd:maxLength value="63"/>
    </xsd:restriction>
  </xsd:simpleType>

  <xsd:simpleType name="DrivenLineOffsetLg">
    <xsd:restriction base="xsd:short">
      <xsd:minInclusive value="-32767"/>
      <xsd:maxInclusive value="32767"/>
    </xsd:restriction>
  </xsd:simpleType>

  <xsd:simpleType name="DrivenLineOffsetSm">
    <xsd:restriction base="xsd:short">
      <xsd:minInclusive value="-2047"/>
      <xsd:maxInclusive value="2047"/>
    </xsd:restriction>
  </xsd:simpleType>

  <xsd:simpleType name="DSecond2">
    <xsd:restriction base="xsd:unsignedShort"/>
  </xsd:simpleType>

  <xsd:simpleType name="DSRCmsgID2">
    <xsd:restriction base="xsd:unsignedByte"/>
  </xsd:simpleType>

  <xsd:simpleType name="DSRCmsgSubID">
    <xsd:restriction base="xsd:unsignedByte"/>
  </xsd:simpleType>

  <xsd:simpleType name="Elevation2">
    <xsd:restriction base="xsd:int">
      <xsd:minInclusive value="-4096"/>
      <xsd:maxInclusive value="61439"/>
    </xsd:restriction>
  </xsd:simpleType>

  <xsd:simpleType name="IntersectionID">
    <xsd:restriction base="xsd:unsignedShort"/>
  </xsd:simpleType>

  <xsd:simpleType name="IntersectionStatusObject">
    <xsd:union>
      <xsd:simpleType>
        <xsd:restriction base="asn1:BitString">
          <xsd:length value="16"/>
        </xsd:restriction>
      </xsd:simpleType>
      <xsd:simpleType>
        <xsd:restriction>
          <xsd:simpleType>
```

```
        <xsd:list>
          <xsd:simpleType>
            <xsd:restriction base="xsd:token">
              <xsd:enumeration value="manualControlIsEnabled"/>
              <xsd:enumeration value="stopTimeIsActivated"/>
              <xsd:enumeration value="failureFlash"/>
              <xsd:enumeration value="preemptIsActive"/>
              <xsd:enumeration value="transitSignalPriorityIsActive"/>
              <xsd:enumeration value="fixedTimeOperation"/>
              <xsd:enumeration value="trafficDependentOperation"/>
              <xsd:enumeration value="standbyOperation"/>
              <xsd:enumeration value="failureMode"/>
              <xsd:enumeration value="off"/>
              <xsd:enumeration value="recentMAPmessageUpdate"/>
              <xsd:enumeration value="recentChangeInMAPassignedLanesIDsUsed"/>
              <xsd:enumeration value="noValidMAPisAvailableAtThisTime"/>
              <xsd:enumeration value="noValidSPATisAvailableAtThisTime"/>
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:list>
      </xsd:simpleType>
      <xsd:maxLength value="16"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneAttributes-Barrier">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="median-RevocableLane"/>
                <xsd:enumeration value="median"/>
                <xsd:enumeration value="whiteLineHashing"/>
                <xsd:enumeration value="stripedLines"/>
                <xsd:enumeration value="doubleStripedLines"/>
                <xsd:enumeration value="trafficCones"/>
                <xsd:enumeration value="constructionBarrier"/>
                <xsd:enumeration value="trafficChannels"/>
                <xsd:enumeration value="lowCurbs"/>
                <xsd:enumeration value="highCurbs"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
```

```
    </xsd:union>
  </xsd:simpleType>

  <xsd:simpleType name="LaneAttributes-Bike">
    <xsd:union>
      <xsd:simpleType>
        <xsd:restriction base="asn1:BitString">
          <xsd:length value="16"/>
        </xsd:restriction>
      </xsd:simpleType>
      <xsd:simpleType>
        <xsd:restriction>
          <xsd:simpleType>
            <xsd:list>
              <xsd:simpleType>
                <xsd:restriction base="xsd:token">
                  <xsd:enumeration value="bikeRevocableLane"/>
                  <xsd:enumeration value="pedestrianUseAllowed"/>
                  <xsd:enumeration value="isBikeFlyOverLane"/>
                  <xsd:enumeration value="fixedCycleTime"/>
                  <xsd:enumeration value="biDirectionalCycleTimes"/>
                  <xsd:enumeration value="isolatedByBarrier"/>
                  <xsd:enumeration value="unsignalizedSegmentsPresent"/>
                </xsd:restriction>
              </xsd:simpleType>
            </xsd:list>
          </xsd:simpleType>
          <xsd:maxLength value="16"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:union>
  </xsd:simpleType>

  <xsd:simpleType name="LaneAttributes-Crosswalk">
    <xsd:union>
      <xsd:simpleType>
        <xsd:restriction base="asn1:BitString">
          <xsd:length value="16"/>
        </xsd:restriction>
      </xsd:simpleType>
      <xsd:simpleType>
        <xsd:restriction>
          <xsd:simpleType>
            <xsd:list>
              <xsd:simpleType>
                <xsd:restriction base="xsd:token">
                  <xsd:enumeration value="crosswalkRevocableLane"/>
                  <xsd:enumeration value="bicyleUseAllowed"/>
                  <xsd:enumeration value="isXwalkFlyOverLane"/>
                  <xsd:enumeration value="fixedCycleTime"/>
                  <xsd:enumeration value="biDirectionalCycleTimes"/>
                  <xsd:enumeration value="hasPushToWalkButton"/>
                  <xsd:enumeration value="audioSupport"/>
                  <xsd:enumeration value="rfSignalRequestPresent"/>
                  <xsd:enumeration value="unsignalizedSegmentsPresent"/>
                </xsd:restriction>
              </xsd:simpleType>
            </xsd:list>
          </xsd:simpleType>
```

```
            </xsd:list>
          </xsd:simpleType>
          <xsd:maxLength value="16"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneAttributes-Parking">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="parkingRevocableLane"/>
                <xsd:enumeration value="parallelParkingInUse"/>
                <xsd:enumeration value="headInParkingInUse"/>
                <xsd:enumeration value="doNotParkZone"/>
                <xsd:enumeration value="parkingForBusUse"/>
                <xsd:enumeration value="parkingForTaxiUse"/>
                <xsd:enumeration value="noPublicParkingUse"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneAttributes-Sidewalk">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="sidewalk-RevocableLane"/>
                <xsd:enumeration value="bicyleUseAllowed"/>
                <xsd:enumeration value="isSidewalkFlyOverLane"/>
                <xsd:enumeration value="walkBikes"/>
              </xsd:restriction>
            </xsd:simpleType>
```

```
            </xsd:list>
          </xsd:simpleType>
          <xsd:maxLength value="16"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneAttributes-Striping">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="stripToConnectingLanesRevocableLane"/>
                <xsd:enumeration value="stripDrawOnLeft"/>
                <xsd:enumeration value="stripDrawOnRight"/>
                <xsd:enumeration value="stripToConnectingLanesLeft"/>
                <xsd:enumeration value="stripToConnectingLanesRight"/>
                <xsd:enumeration value="stripToConnectingLanesAhead"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneAttributes-TrackedVehicle">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="spec-RevocableLane"/>
                <xsd:enumeration value="spec-commuterRailRoadTrack"/>
                <xsd:enumeration value="spec-lightRailRoadTrack"/>
                <xsd:enumeration value="spec-heavyRailRoadTrack"/>
                <xsd:enumeration value="spec-otherRailType"/>
              </xsd:restriction>
            </xsd:simpleType>
```

```
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneAttributes-Vehicle">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="isVehicleRevocableLane"/>
                <xsd:enumeration value="isVehicleFlyOverLane"/>
                <xsd:enumeration value="hovLaneUseOnly"/>
                <xsd:enumeration value="restrictedToBusUse"/>
                <xsd:enumeration value="restrictedToTaxiUse"/>
                <xsd:enumeration value="restrictedFromPublicUse"/>
                <xsd:enumeration value="hasIRbeaconCoverage"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="16"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneConnectionID">
  <xsd:restriction base="xsd:unsignedByte"/>
</xsd:simpleType>

<xsd:simpleType name="LaneDirection">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="2"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="ingressPath"/>
                <xsd:enumeration value="egressPath"/>
```

```
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:list>
      </xsd:simpleType>
      <xsd:maxLength value="2"/>
    </xsd:restriction>
  </xsd:simpleType>
 </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneSharing">
  <xsd:union>
    <xsd:simpleType>
      <xsd:restriction base="asn1:BitString">
        <xsd:length value="10"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
      <xsd:restriction>
        <xsd:simpleType>
          <xsd:list>
            <xsd:simpleType>
              <xsd:restriction base="xsd:token">
                <xsd:enumeration value="overlappingLaneDescriptionProvided"/>
                <xsd:enumeration value="multipleLanesTreatedAsOneLane"/>
                <xsd:enumeration value="otherNonMotorizedTrafficTypes"/>
                <xsd:enumeration value="individualMotorizedVehicleTraffic"/>
                <xsd:enumeration value="busVehicleTraffic"/>
                <xsd:enumeration value="taxiVehicleTraffic"/>
                <xsd:enumeration value="pedestriansTraffic"/>
                <xsd:enumeration value="cyclistVehicleTraffic"/>
                <xsd:enumeration value="trackedVehicleTraffic"/>
                <xsd:enumeration value="pedestrianTraffic"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:list>
        </xsd:simpleType>
        <xsd:maxLength value="10"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="LaneWidth">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="32767"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="LayerID">
  <xsd:restriction base="xsd:unsignedByte">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="100"/>
  </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:simpleType name="LayerType">
  <xsd:union memberTypes="xsd:token">
    <xsd:simpleType>
      <xsd:restriction base="xsd:token">
        <xsd:enumeration value="none"/>
        <xsd:enumeration value="mixedContent"/>
        <xsd:enumeration value="generalMapData"/>
        <xsd:enumeration value="intersectionData"/>
        <xsd:enumeration value="curveData"/>
        <xsd:enumeration value="roadwaySectionData"/>
        <xsd:enumeration value="parkingAreaData"/>
        <xsd:enumeration value="sharedLaneData"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="MergeDivergeNodeAngle">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-180"/>
    <xsd:maxInclusive value="180"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="MinuteOfTheYear">
  <xsd:restriction base="xsd:unsignedInt">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="527040"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="MovementPhaseState">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="unavailable"/>
    <xsd:enumeration value="dark"/>
    <xsd:enumeration value="stop-Then-Proceed"/>
    <xsd:enumeration value="stop-And-Remain"/>
    <xsd:enumeration value="pre-Movement"/>
    <xsd:enumeration value="permissive-Movement-Allowed"/>
    <xsd:enumeration value="protected-Movement-Allowed"/>
    <xsd:enumeration value="permissive-clearance"/>
    <xsd:enumeration value="protected-clearance"/>
    <xsd:enumeration value="caution-Conflicting-Traffic"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="MsgCount">
  <xsd:restriction base="xsd:unsignedByte">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="127"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="MsgCRC">
  <xsd:restriction base="xsd:hexBinary">
    <xsd:length value="2"/>
  </xsd:restriction>
```

```
</xsd:simpleType>

<xsd:simpleType name="NodeAttribute">
  <xsd:union memberTypes="xsd:token">
    <xsd:simpleType>
      <xsd:restriction base="xsd:token">
        <xsd:enumeration value="reserved"/>
        <xsd:enumeration value="stopLine"/>
        <xsd:enumeration value="roundedCapStyleA"/>
        <xsd:enumeration value="roundedCapStyleB"/>
        <xsd:enumeration value="mergePoint"/>
        <xsd:enumeration value="divergePoint"/>
        <xsd:enumeration value="downstreamStopLine"/>
        <xsd:enumeration value="downstreamStartNode"/>
        <xsd:enumeration value="closedToTraffic"/>
        <xsd:enumeration value="safeIsland"/>
        <xsd:enumeration value="curbPresentAtStepOff"/>
        <xsd:enumeration value="hydrantPresent"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="PedestrianBicycleDetect">
  <xsd:restriction base="xsd:boolean"/>
</xsd:simpleType>

<xsd:simpleType name="RestrictionAppliesTo">
  <xsd:union memberTypes="xsd:token">
    <xsd:simpleType>
      <xsd:restriction base="xsd:token">
        <xsd:enumeration value="none"/>
        <xsd:enumeration value="equippedTransit"/>
        <xsd:enumeration value="equippedTaxis"/>
        <xsd:enumeration value="equippedOther"/>
        <xsd:enumeration value="emissionCompliant"/>
        <xsd:enumeration value="equippedBicycle"/>
        <xsd:enumeration value="weightCompliant"/>
        <xsd:enumeration value="heightCompliant"/>
        <xsd:enumeration value="pedestrians"/>
        <xsd:enumeration value="slowMovingPersons"/>
        <xsd:enumeration value="wheelchairUsers"/>
        <xsd:enumeration value="visualDisabilities"/>
        <xsd:enumeration value="audioDisabilities"/>
        <xsd:enumeration value="otherUnknownDisabilities"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="RestrictionClassID">
  <xsd:restriction base="xsd:unsignedByte"/>
</xsd:simpleType>

<xsd:simpleType name="RoadRegulatorID">
  <xsd:restriction base="xsd:unsignedShort"/>
</xsd:simpleType>
```

```
<xsd:simpleType name="RoadSegmentID">
  <xsd:restriction base="xsd:unsignedShort"/>
</xsd:simpleType>

<xsd:simpleType name="RoadwayCrownAngle">
  <xsd:restriction base="xsd:byte"/>
</xsd:simpleType>

<xsd:simpleType name="Scale-B12">
  <xsd:restriction base="xsd:short">
    <xsd:minInclusive value="-2048"/>
    <xsd:maxInclusive value="2047"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="SegmentAttribute">
  <xsd:union memberTypes="xsd:token">
    <xsd:simpleType>
      <xsd:restriction base="xsd:token">
        <xsd:enumeration value="reserved"/>
        <xsd:enumeration value="doNotBlock"/>
        <xsd:enumeration value="whiteLine"/>
        <xsd:enumeration value="mergingLaneLeft"/>
        <xsd:enumeration value="mergingLaneRight"/>
        <xsd:enumeration value="curbOnLeft"/>
        <xsd:enumeration value="curbOnRight"/>
        <xsd:enumeration value="loadingzoneOnLeft"/>
        <xsd:enumeration value="loadingzoneOnRight"/>
        <xsd:enumeration value="turnOutPointOnLeft"/>
        <xsd:enumeration value="turnOutPointOnRight"/>
        <xsd:enumeration value="adjacentParkingOnLeft"/>
        <xsd:enumeration value="adjacentParkingOnRight"/>
        <xsd:enumeration value="adjacentBikeLaneOnLeft"/>
        <xsd:enumeration value="adjacentBikeLaneOnRight"/>
        <xsd:enumeration value="sharedBikeLane"/>
        <xsd:enumeration value="bikeBoxInFront"/>
        <xsd:enumeration value="transitStopOnLeft"/>
        <xsd:enumeration value="transitStopOnRight"/>
        <xsd:enumeration value="transitStopInLane"/>
        <xsd:enumeration value="sharedWithTrackedVehicle"/>
        <xsd:enumeration value="safeIsland"/>
        <xsd:enumeration value="lowCurbsPresent"/>
        <xsd:enumeration value="rumbleStripPresent"/>
        <xsd:enumeration value="audibleSignalingPresent"/>
        <xsd:enumeration value="adaptiveTimingPresent"/>
        <xsd:enumeration value="rfSignalRequestPresent"/>
        <xsd:enumeration value="partialCurbIntrusion"/>
        <xsd:enumeration value="taperToLeft"/>
        <xsd:enumeration value="taperToRight"/>
        <xsd:enumeration value="taperToCenterLine"/>
        <xsd:enumeration value="parallelParking"/>
        <xsd:enumeration value="headInParking"/>
        <xsd:enumeration value="freeParking"/>
        <xsd:enumeration value="timeRestrictionsOnParking"/>
        <xsd:enumeration value="costToPark"/>
        <xsd:enumeration value="midBlockCurbPresent"/>
```

```xml
          <xsd:enumeration value="unEvenPavementPresent"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="SignalControlState">
  <xsd:restriction base="xsd:hexBinary">
    <xsd:length value="1"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="SpeedAdvice">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="500"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="SpeedLimitType">
  <xsd:union memberTypes="xsd:token">
    <xsd:simpleType>
      <xsd:restriction base="xsd:token">
        <xsd:enumeration value="unknown"/>
        <xsd:enumeration value="maxsd:peedInSchoolZone"/>
        <xsd:enumeration value="maxsd:peedInSchoolZoneWhenChildrenArePresent"/>
        <xsd:enumeration value="maxsd:peedInConstructionZone"/>
        <xsd:enumeration value="vehicleMinSpeed"/>
        <xsd:enumeration value="vehicleMaxsd:peed"/>
        <xsd:enumeration value="vehicleNightMaxsd:peed"/>
        <xsd:enumeration value="truckMinSpeed"/>
        <xsd:enumeration value="truckMaxsd:peed"/>
        <xsd:enumeration value="truckNightMaxsd:peed"/>
        <xsd:enumeration value="vehiclesWithTrailersMinSpeed"/>
        <xsd:enumeration value="vehiclesWithTrailersMaxsd:peed"/>
        <xsd:enumeration value="vehiclesWithTrailersNightMaxsd:peed"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="TimeIntervalConfidence">
  <xsd:restriction base="xsd:unsignedByte">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="15"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="TimeMark">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="36002"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="Velocity">
  <xsd:restriction base="xsd:unsignedShort">
```

```xml
      <xsd:minInclusive value="0"/>
      <xsd:maxInclusive value="8191"/>
    </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="WaitOnStopline">
  <xsd:restriction base="xsd:boolean"/>
</xsd:simpleType>

<xsd:simpleType name="ZoneLength">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0"/>
    <xsd:maxInclusive value="10000"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="IntersectionReferenceID">
  <xsd:sequence>
    <xsd:element name="region" minOccurs="0" type="RoadRegulatorID"/>
    <xsd:element name="id" type="IntersectionID"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Position3D-2">
  <xsd:sequence>
    <xsd:element name="lat" type="ITS-Container:Latitude"/>
    <xsd:element name="long" type="ITS-Container:Longitude"/>
    <xsd:element name="elevation" minOccurs="0" type="Elevation2"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalPosition3D"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RegulatorySpeedLimit">
  <xsd:sequence>
    <xsd:element name="type" type="SpeedLimitType"/>
    <xsd:element name="speed" type="Velocity"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="SpeedLimitList">
  <xsd:sequence minOccurs="1" maxOccurs="9">
    <xsd:element name="RegulatorySpeedLimit" type="RegulatorySpeedLimit"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="LaneTypeAttributes">
  <xsd:choice>
    <xsd:element name="vehicle" type="LaneAttributes-Vehicle"/>
    <xsd:element name="crosswalk" type="LaneAttributes-Crosswalk"/>
    <xsd:element name="bikeLane" type="LaneAttributes-Bike"/>
    <xsd:element name="sidewalk" type="LaneAttributes-Sidewalk"/>
    <xsd:element name="median" type="LaneAttributes-Barrier"/>
    <xsd:element name="striping" type="LaneAttributes-Striping"/>
    <xsd:element name="trackedVehicle" type="LaneAttributes-TrackedVehicle"/>
    <xsd:element name="parking" type="LaneAttributes-Parking"/>
  </xsd:choice>
</xsd:complexType>
```

```xml
<xsd:complexType name="LaneAttributes">
  <xsd:sequence>
    <xsd:element name="directionalUse" type="LaneDirection"/>
    <xsd:element name="sharedWith" type="LaneSharing"/>
    <xsd:element name="laneType" type="LaneTypeAttributes"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalLaneAttributes"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="NodeAttributeList">
  <xsd:restriction>
    <xsd:simpleType>
      <xsd:list itemType="NodeAttribute"/>
    </xsd:simpleType>
    <xsd:minLength value="1"/>
    <xsd:maxLength value="8"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="SegmentAttributeList">
  <xsd:restriction>
    <xsd:simpleType>
      <xsd:list itemType="SegmentAttribute"/>
    </xsd:simpleType>
    <xsd:minLength value="1"/>
    <xsd:maxLength value="8"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="LaneDataAttribute">
  <xsd:choice>
    <xsd:element name="pathEndPointAngle" type="DeltaAngle"/>
    <xsd:element name="laneCrownPointCenter" type="RoadwayCrownAngle"/>
    <xsd:element name="laneCrownPointLeft" type="RoadwayCrownAngle"/>
    <xsd:element name="laneCrownPointRight" type="RoadwayCrownAngle"/>
    <xsd:element name="laneAngle" type="MergeDivergeNodeAngle"/>
    <xsd:element name="speedLimits" type="SpeedLimitList"/>
    <xsd:element name="regional" type="RegionalLaneDataAttribute"/>
  </xsd:choice>
</xsd:complexType>

<xsd:complexType name="LaneDataAttributeList">
  <xsd:sequence minOccurs="1" maxOccurs="8">
    <xsd:element name="LaneDataAttribute" type="LaneDataAttribute"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RegionalNodeAttributeList">
  <xsd:sequence minOccurs="1" maxOccurs="8">
    <xsd:element name="RegionalNodeAttribute" type="RegionalNodeAttribute"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="NodeAttributeSet">
  <xsd:sequence>
    <xsd:element name="localNode" minOccurs="0" type="NodeAttributeList"/>
```

```xml
    <xsd:element name="disabled" minOccurs="0" type="SegmentAttributeList"/>
    <xsd:element name="enabled" minOccurs="0" type="SegmentAttributeList"/>
    <xsd:element name="data" minOccurs="0" type="LaneDataAttributeList"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalNodeAttributeList"/>
    <xsd:element name="dWidth" minOccurs="0" type="Offset-B10"/>
    <xsd:element name="dElevation" minOccurs="0" type="Offset-B10"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Node">
  <xsd:sequence>
    <xsd:element name="delta" type="NodeOffsetPoint"/>
    <xsd:element name="attributes" minOccurs="0" type="NodeAttributeSet"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="NodeSet">
  <xsd:sequence minOccurs="2" maxOccurs="63">
    <xsd:element name="Node" type="Node"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="ComputedLane">
  <xsd:sequence>
    <xsd:element name="referenceLaneId" type="LaneID"/>
    <xsd:element name="offsetXaxis">
      <xsd:complexType>
        <xsd:choice>
          <xsd:element name="small" type="DrivenLineOffsetSm"/>
          <xsd:element name="large" type="DrivenLineOffsetLg"/>
        </xsd:choice>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="offsetYaxis">
      <xsd:complexType>
        <xsd:choice>
          <xsd:element name="small" type="DrivenLineOffsetSm"/>
          <xsd:element name="large" type="DrivenLineOffsetLg"/>
        </xsd:choice>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="rotateXY" minOccurs="0" type="Angle"/>
    <xsd:element name="scaleXaxis" minOccurs="0" type="Scale-B12"/>
    <xsd:element name="scaleYaxis" minOccurs="0" type="Scale-B12"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalComputedLane"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="NodeList2">
  <xsd:choice>
    <xsd:element name="nodes" type="NodeSet"/>
    <xsd:element name="computed" type="ComputedLane"/>
  </xsd:choice>
</xsd:complexType>

<xsd:complexType name="ConnectingLane">
  <xsd:sequence>
```

```
        <xsd:element name="lane" type="LaneID"/>
        <xsd:element name="maneuver" minOccurs="0" type="AllowedManeuvers"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Connection">
    <xsd:sequence>
        <xsd:element name="connectingLane" type="ConnectingLane"/>
        <xsd:element name="remoteIntersection" minOccurs="0" type="IntersectionReferenceID"/>
        <xsd:element name="signalGroup" minOccurs="0" type="SignalGroupID"/>
        <xsd:element name="userClass" minOccurs="0" type="RestrictionClassID"/>
        <xsd:element name="connectionID" minOccurs="0" type="LaneConnectionID"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="ConnectsToList">
    <xsd:sequence minOccurs="1" maxOccurs="16">
        <xsd:element name="Connection" type="Connection"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="OverlayLaneList">
    <xsd:restriction>
        <xsd:simpleType>
            <xsd:list itemType="LaneID"/>
        </xsd:simpleType>
        <xsd:minLength value="1"/>
        <xsd:maxLength value="5"/>
    </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="GenericLane">
    <xsd:sequence>
        <xsd:element name="laneID" type="LaneID"/>
        <xsd:element name="ingressApproach" minOccurs="0" type="ApproachID"/>
        <xsd:element name="egressApproach" minOccurs="0" type="ApproachID"/>
        <xsd:element name="laneAttributes" type="LaneAttributes"/>
        <xsd:element name="maneuvers" minOccurs="0" type="AllowedManeuvers"/>
        <xsd:element name="nodeList" type="NodeList2"/>
        <xsd:element name="connectsTo" minOccurs="0" type="ConnectsToList"/>
        <xsd:element name="overlays" minOccurs="0" type="OverlayLaneList"/>
        <xsd:element name="regional" minOccurs="0" type="RegionalGenericLane"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="LaneList">
    <xsd:sequence minOccurs="1" maxOccurs="255">
        <xsd:element name="GenericLane" type="GenericLane"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="PreemptPriorityList">
    <xsd:sequence minOccurs="1" maxOccurs="32">
        <xsd:element name="RegionalSignalControlZone" type="RegionalSignalControlZone"/>
    </xsd:sequence>
</xsd:complexType>
```

```
<xsd:complexType name="IntersectionGeometry">
  <xsd:sequence>
    <xsd:element name="id" type="IntersectionReferenceID"/>
    <xsd:element name="revision" type="MsgCount"/>
    <xsd:element name="refPoint" type="Position3D-2"/>
    <xsd:element name="laneWidth" minOccurs="0" type="LaneWidth"/>
    <xsd:element name="speedLimits" minOccurs="0" type="SpeedLimitList"/>
    <xsd:element name="laneSet" type="LaneList"/>
    <xsd:element name="preemptPriorityData" minOccurs="0" type="PreemptPriorityList"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalIntersection"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="IntersectionGeometryList">
  <xsd:sequence minOccurs="1" maxOccurs="32">
    <xsd:element name="IntersectionGeometry" type="IntersectionGeometry"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RoadSegmentReferenceID">
  <xsd:sequence>
    <xsd:element name="region" minOccurs="0" type="RoadRegulatorID"/>
    <xsd:element name="id" type="RoadSegmentID"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RoadLaneSetList">
  <xsd:sequence minOccurs="1" maxOccurs="255">
    <xsd:element name="GenericLane" type="GenericLane"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RoadSegment">
  <xsd:sequence>
    <xsd:element name="id" type="RoadSegmentReferenceID"/>
    <xsd:element name="revision" type="MsgCount"/>
    <xsd:element name="refPoint" type="Position3D-2"/>
    <xsd:element name="laneWidth" minOccurs="0" type="LaneWidth"/>
    <xsd:element name="speedLimits" minOccurs="0" type="SpeedLimitList"/>
    <xsd:element name="roadLaneSet" type="RoadLaneSetList"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalRoadSegment"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RoadSegmentList">
  <xsd:sequence minOccurs="1" maxOccurs="32">
    <xsd:element name="RoadSegment" type="RoadSegment"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="DataParameters">
  <xsd:sequence>
    <xsd:element name="processMethod" minOccurs="0">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:minLength value="1"/>
          <xsd:maxLength value="255"/>
```

```
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="processAgency" minOccurs="0">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:minLength value="1"/>
          <xsd:maxLength value="255"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="lastCheckedDate" minOccurs="0">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:minLength value="1"/>
          <xsd:maxLength value="255"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="geoidUsed" minOccurs="0">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:minLength value="1"/>
          <xsd:maxLength value="255"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RestrictionUserType">
  <xsd:choice>
    <xsd:element name="basicType" type="RestrictionAppliesTo"/>
    <xsd:element name="regional" type="RegionalRestrictionUserType"/>
  </xsd:choice>
</xsd:complexType>

<xsd:complexType name="RestrictionUserTypeList">
  <xsd:sequence minOccurs="1" maxOccurs="16">
    <xsd:element name="RestrictionUserType" type="RestrictionUserType"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RestrictionClassAssignment">
  <xsd:sequence>
    <xsd:element name="id" type="RestrictionClassID"/>
    <xsd:element name="users" type="RestrictionUserTypeList"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RestrictionClassList">
  <xsd:sequence minOccurs="1" maxOccurs="254">
    <xsd:element name="RestrictionClassAssignment" type="RestrictionClassAssignment"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="EnabledLaneList">
```

```
<xsd:restriction>
  <xsd:simpleType>
    <xsd:list itemType="LaneID"/>
  </xsd:simpleType>
  <xsd:minLength value="1"/>
  <xsd:maxLength value="16"/>
</xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="TimeChangeDetails">
  <xsd:sequence>
    <xsd:element name="startTime" minOccurs="0" type="TimeMark"/>
    <xsd:element name="minEndTime" type="TimeMark"/>
    <xsd:element name="maxEndTime" minOccurs="0" type="TimeMark"/>
    <xsd:element name="likelyTime" minOccurs="0" type="TimeMark"/>
    <xsd:element name="confidence" minOccurs="0" type="TimeIntervalConfidence"/>
    <xsd:element name="nextTime" minOccurs="0" type="TimeMark"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="AdvisorySpeed">
  <xsd:sequence>
    <xsd:element name="type" type="AdvisorySpeedType"/>
    <xsd:element name="speed" minOccurs="0" type="SpeedAdvice"/>
    <xsd:element name="confidence" minOccurs="0" type="ITS-Container:SpeedConfidence"/>
    <xsd:element name="distance" minOccurs="0" type="ZoneLength"/>
    <xsd:element name="class" minOccurs="0" type="RestrictionClassID"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalAdvisorySpeed"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="AdvisorySpeedList">
  <xsd:sequence minOccurs="1" maxOccurs="16">
    <xsd:element name="AdvisorySpeed" type="AdvisorySpeed"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="MovementEvent">
  <xsd:sequence>
    <xsd:element name="eventState" type="MovementPhaseState"/>
    <xsd:element name="timing" minOccurs="0" type="TimeChangeDetails"/>
    <xsd:element name="speeds" minOccurs="0" type="AdvisorySpeedList"/>
    <xsd:element name="regional" minOccurs="0" type="RegionalMovementEvent"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="MovementEventList">
  <xsd:sequence minOccurs="1" maxOccurs="16">
    <xsd:element name="MovementEvent" type="MovementEvent"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="ConnectionManeuverAssist">
  <xsd:sequence>
    <xsd:element name="connectionID" type="LaneConnectionID"/>
    <xsd:element name="queueLength" minOccurs="0" type="ZoneLength"/>
    <xsd:element name="availableStorageLength" minOccurs="0" type="ZoneLength"/>
```

```xml
      <xsd:element name="waitOnStop" minOccurs="0" type="WaitOnStopline"/>
      <xsd:element name="pedBicycleDetect" minOccurs="0" type="PedestrianBicycleDetect"/>
      <xsd:element name="regional" minOccurs="0" type="RegionalConnectionManeuverAssist"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="ManeuverAssistList">
    <xsd:sequence minOccurs="1" maxOccurs="16">
      <xsd:element name="ConnectionManeuverAssist" type="ConnectionManeuverAssist"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="MovementState">
    <xsd:sequence>
      <xsd:element name="signalGroup" type="SignalGroupID"/>
      <xsd:element name="state-time-speed" type="MovementEventList"/>
      <xsd:element name="maneuverAssistList" minOccurs="0" type="ManeuverAssistList"/>
      <xsd:element name="regional" minOccurs="0" type="RegionalMovementState"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="MovementList">
    <xsd:sequence minOccurs="1" maxOccurs="255">
      <xsd:element name="MovementState" type="MovementState"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="IntersectionState">
    <xsd:sequence>
      <xsd:element name="id" type="IntersectionReferenceID"/>
      <xsd:element name="revision" type="MsgCount"/>
      <xsd:element name="status" type="IntersectionStatusObject"/>
      <xsd:element name="moy" minOccurs="0" type="MinuteOfTheYear"/>
      <xsd:element name="timeStamp" minOccurs="0" type="DSecond2"/>
      <xsd:element name="enabledLanes" minOccurs="0" type="EnabledLaneList"/>
      <xsd:element name="states" type="MovementList"/>
      <xsd:element name="maneuverAssistList" minOccurs="0" type="ManeuverAssistList"/>
      <xsd:element name="priority" minOccurs="0" type="SignalControlState"/>
      <xsd:element name="preempt" minOccurs="0" type="SignalControlState"/>
      <xsd:element name="regional" minOccurs="0" type="RegionalIntersectionState"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="IntersectionStateList">
    <xsd:sequence minOccurs="1" maxOccurs="32">
      <xsd:element name="IntersectionState" type="IntersectionState"/>
    </xsd:sequence>
  </xsd:complexType>

</xsd:schema>
```

1.3   ITS-Container.xsd - Data types used in ITS

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="ITS-Container"
  targetNamespace="ITS-Container"
  elementFormDefault="qualified">

  <xsd:simpleType name="Latitude">
   <xsd:union>
    <xsd:simpleType>
     <xsd:restriction base="xsd:token">
       <xsd:enumeration value="oneMicrodegreeSouth"/>
       <xsd:enumeration value="oneMicrodegreeNorth"/>
       <xsd:enumeration value="unavailable"/>
     </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
     <xsd:restriction base="xsd:int">
       <xsd:minInclusive value="-900000000"/>
       <xsd:maxInclusive value="900000001"/>
     </xsd:restriction>
    </xsd:simpleType>
   </xsd:union>
  </xsd:simpleType>

  <xsd:simpleType name="Longitude">
   <xsd:union>
    <xsd:simpleType>
     <xsd:restriction base="xsd:token">
       <xsd:enumeration value="oneMicrodegreeWest"/>
       <xsd:enumeration value="oneMicrodegreeEast"/>
       <xsd:enumeration value="unavailable"/>
     </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
     <xsd:restriction base="xsd:int">
       <xsd:minInclusive value="-1800000000"/>
       <xsd:maxInclusive value="1800000001"/>
     </xsd:restriction>
    </xsd:simpleType>
   </xsd:union>
  </xsd:simpleType>

  <xsd:simpleType name="SpeedConfidence">
   <xsd:union>
    <xsd:simpleType>
     <xsd:restriction base="xsd:token">
       <xsd:enumeration value="equalOrWithinOneCentimeterPerSec"/>
       <xsd:enumeration value="equalOrWithinOneMeterPerSec"/>
       <xsd:enumeration value="outOfRange"/>
       <xsd:enumeration value="unavailable"/>
     </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType>
     <xsd:restriction base="xsd:unsignedByte">
       <xsd:minInclusive value="1"/>
```

```
                <xsd:maxInclusive value="127"/>
            </xsd:restriction>
        </xsd:simpleType>
    </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="AltitudeValue">
    <xsd:union>
        <xsd:simpleType>
            <xsd:restriction base="xsd:token">
                <xsd:enumeration value="referenceEllipsoidSurface"/>
                <xsd:enumeration value="oneCentimeter"/>
                <xsd:enumeration value="unavailable"/>
            </xsd:restriction>
        </xsd:simpleType>
        <xsd:simpleType>
            <xsd:restriction base="xsd:int">
                <xsd:minInclusive value="-100000"/>
                <xsd:maxInclusive value="800001"/>
            </xsd:restriction>
        </xsd:simpleType>
    </xsd:union>
</xsd:simpleType>

<xsd:simpleType name="AltitudeConfidence">
    <xsd:restriction base="xsd:token">
        <xsd:enumeration value="alt-000-01"/>
        <xsd:enumeration value="alt-000-02"/>
        <xsd:enumeration value="alt-000-05"/>
        <xsd:enumeration value="alt-000-10"/>
        <xsd:enumeration value="alt-000-20"/>
        <xsd:enumeration value="alt-000-50"/>
        <xsd:enumeration value="alt-001-00"/>
        <xsd:enumeration value="alt-002-00"/>
        <xsd:enumeration value="alt-005-00"/>
        <xsd:enumeration value="alt-010-00"/>
        <xsd:enumeration value="alt-020-00"/>
        <xsd:enumeration value="alt-050-00"/>
        <xsd:enumeration value="alt-100-00"/>
        <xsd:enumeration value="alt-200-00"/>
        <xsd:enumeration value="outOfRange"/>
        <xsd:enumeration value="unavailable"/>
    </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="Altitude">
    <xsd:sequence>
        <xsd:element name="altitudeValue" type="AltitudeValue"/>
        <xsd:element name="altitudeConfidence" type="AltitudeConfidence"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="StationID">
    <xsd:restriction base="xsd:unsignedInt"/>
</xsd:simpleType>

</xsd:schema>
```

1.4   REGION.xsd - Regional variations

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="REGION"
  xmlns="REGION">

  <xsd:complexType name="Reg-AdvisorySpeed">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-ComputedLane">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-NodeOffsetPoint">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-GenericLane">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-Intersection">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-LaneAttributes">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-LaneDataAttribute">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-MovementEvent">
    <xsd:sequence>
      <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-MovementState">
```

```xml
  <xsd:sequence>
    <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Reg-NodeAttribute">
  <xsd:sequence>
    <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Reg-RoadSegment">
  <xsd:sequence>
    <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Reg-SignalControlZone">
  <xsd:sequence>
    <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Reg-SPAT">
  <xsd:sequence>
    <xsd:any namespace="##other" processContents="lax" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

</xsd:schema>
```

1.5   REG-D.xsd - European specific variaitions

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="REG-D"
  targetNamespace="REG-D"
  xmlns:ITS-Container="ITS-Container"
  xmlns:CROCS-0-1="CROCS-0-1">

  <xsd:import namespace="ITS-Container" schemaLocation="http://www.idtuk.com/downloads/crocs/schema_0-1/ITS-Container.xsd"/>


  <xsd:complexType name="VehicleToLanePosition">
    <xsd:sequence>
      <xsd:element name="stationID" type="ITS-Container:StationID"/>
      <xsd:element name="laneID" type="CROCS-0-1:LaneID"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="VehicleToLanePositionList">
    <xsd:sequence minOccurs="1" maxOccurs="5">
      <xsd:element name="VehicleToLanePosition" type="VehicleToLanePosition"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-ConnectionManeuverAssist">
    <xsd:sequence>
      <xsd:element name="vehicleToLanePositions" minOccurs="0" type="VehicleToLanePositionList"/>
      <xsd:element name="rsuDistanceFromAnchor" minOccurs="0" type="CROCS-0-1:NodeOffsetPoint"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="PrioritizationResponse">
    <xsd:sequence>
      <xsd:element name="stationID" type="ITS-Container:StationID"/>
      <xsd:element name="priorState" type="CROCS-0-1:PrioritizationResponseStatus"/>
      <xsd:element name="signalGroup" type="CROCS-0-1:SignalGroupID"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="PrioritizationResponseList">
    <xsd:sequence minOccurs="1" maxOccurs="10">
      <xsd:element name="PrioritizationResponse" type="PrioritizationResponse"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="Reg-IntersectionState">
    <xsd:sequence>
      <xsd:element name="activePrioritizations" minOccurs="0" type="PrioritizationResponseList"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="SignalHeadLocation">
    <xsd:sequence>
      <xsd:element name="node" type="CROCS-0-1:NodeOffsetPoint"/>
      <xsd:element name="elevation" type="CROCS-0-1:Offset-B11"/>
```

```xml
        <xsd:element name="signalGroupID" type="CROCS-0-1:SignalGroupID"/>
      </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="SignalHeadLocationList">
      <xsd:sequence minOccurs="1" maxOccurs="20">
        <xsd:element name="SignalHeadLocation" type="SignalHeadLocation"/>
      </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="Reg-MapData">
      <xsd:sequence>
        <xsd:element name="signalHeadLocations" minOccurs="0" type="SignalHeadLocationList"/>
      </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="Reg-Position3D">
      <xsd:sequence>
        <xsd:element name="altitude" minOccurs="0" type="ITS-Container:Altitude"/>
      </xsd:sequence>
    </xsd:complexType>

    <xsd:simpleType name="EmissionType">
      <xsd:union memberTypes="xsd:token">
        <xsd:simpleType>
          <xsd:restriction base="xsd:token">
            <xsd:enumeration value="typeA"/>
            <xsd:enumeration value="typeB"/>
            <xsd:enumeration value="typeC"/>
            <xsd:enumeration value="typeD"/>
            <xsd:enumeration value="typeE"/>
          </xsd:restriction>
        </xsd:simpleType>
        </xsd:union>
    </xsd:simpleType>

    <xsd:complexType name="Reg-RestrictionUserType">
      <xsd:sequence>
        <xsd:element name="emission" minOccurs="0" type="EmissionType"/>
      </xsd:sequence>
    </xsd:complexType>

</xsd:schema>
```

1.6   asn1.xsd - ASN.1 specific data types

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="asn1"
  targetNamespace="asn1"
  elementFormDefault="qualified">

  <xsd:simpleType name="BitString">
    <xsd:restriction base="xsd:string">
      <xsd:pattern value="[0-1]{0,}"/>
    </xsd:restriction>
  </xsd:simpleType>

</xsd:schema>
```